# THREE NEW SPECIES AND ONE NEW RECORD OF GENUS BACTROCERA MACQUART (DIPTERA, TEPHRITIDAE) FROM YUNNAN, CHINA

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Abstract Three new species and one new record species of the genus Bactrocera Macquart (Diptera, Tephritidae). Viz. Bactrocera (Bactrocera) nigrifacia sp. nov., B. (B.) hardyi sp. nov., B. (B.) jinghongensis sp. nov. and Bactrocera (Zeugodacus) vultus (Hardy, 1973), collected from Jinghong, Yunnan Province, China were described. Especially, the three species are all in accord with the definition of the B. dorsalis complex sensu Drew et Hancock (1994). The type specimens are deposited in Fujian Agriculture and Forestry University, Chinese Academy of Sciences.

Key words Diptera, Tephritidae, Bactrocera, new species, Jinghong, China.

#### Introduction

The genus Bactrocera Macquart belongs to the subfamily Dacinae (Diptera, Tephritidae), which was erected by Macquart (1835) for a single species, B. longiconis Macquart from Solomon Is. Fruit flies of the genus Bactrocera Macquart are distributed mainly in tropical Asia, the Pacific and Australian Regions, including more than 470 described species (White et Hancock, 1997). Considerable work was undertaken on the taxonomy of fruit flies of the tribe Dacini in various parts of Asia (Bezzi, 1913, 1915, 1916; Drew et Hancock, 1994; Drew et Kenji, 2005; Hardy, 1954, 1955, 1969, 1973, 1974, 1982, 1983; Ito, 1983; Kapoor, 1971, 1980, 1993; Kenji et White, 2001; Munro, 1935, 1939; Perkins, 1938; Shiraki, 1933, 1968; Wang, 1996), and Australia (Drew, 1989: Drew et Hancock, 1995).

In China, 40 species of *Bactrocera* Macquart had been recorded by Wang in 1996, then three species from Hainan were added by Lin in 2005 and 2006. Recently two species from Yunnan were added by Wang in 2008. This paper deals with the results of an extensive fruit-fly survey in Jinghong Yunnan, China from May 2005 to Dec. 2010. Three new species and one new record were found and described here, and the new three species are all in accord with the definition of the *B. dorsalis* complex sensu Drew et Hancock (1994).

Bactrocera Macquart, 1835

Bactrocera Macquart, 1835: 452. Type-species: B. longicornis Macquart, 1835, by monotypy.

Dasyneura Saunders, 1842: 60. Type-species: D. zonata Saunders, 1842

[ = Bactrocera (Bactrocera) zonata (Saunders, 1842)], by monotypy.

Strumeta Walker, 1856: 33. Type-species: S. conformis Walker, 1856

[ = Bactrocera (Bactrocera) umbrosa (Fabricius, 1805)], by monotypy.

Chaetodacus Bezzi, 1913: 93. Type-species: Musca ferruginea Fabricius, 1794 [ = Bactrocera (Bactrocera) dorsalis (Hendel, 1912)], by original designation.

Marquesadacus Malloch, 1932: 145 (as subgenus of Dacus). Typespecies: Chaetodacus perfuscus Aubertin, 1929 [ = Bactrocera
(Bactrocera) perfusca (Aubertin, 1929)], by monotypy.

Apodacus Perkins, 1939: 26. Type-species: A. cheesmanae Perkins, 1939

[ = Bactrocera (Bactrocera) cheesmanae (Perkins, 1939)], by original designation.

Aglaodacus Munro, 1984: 25, Type-species: A. nesiotes Munro, 1984

[ = Bactrocera (Daculus) nesiotes (Munro, 1984)], by original designation.

Mauritidacus Munto, 1984: 25, Type-species: M. montyanus Munro, 1984 [ = Bactrocera (Afrodacus) montyanus (Munro, 1984)], by original designation.

Bactrocera (Bactrocera) nigrifacia sp. nov. (Figs 1 -4)

Description. Male, body length 5.0 - 5.7 mm.

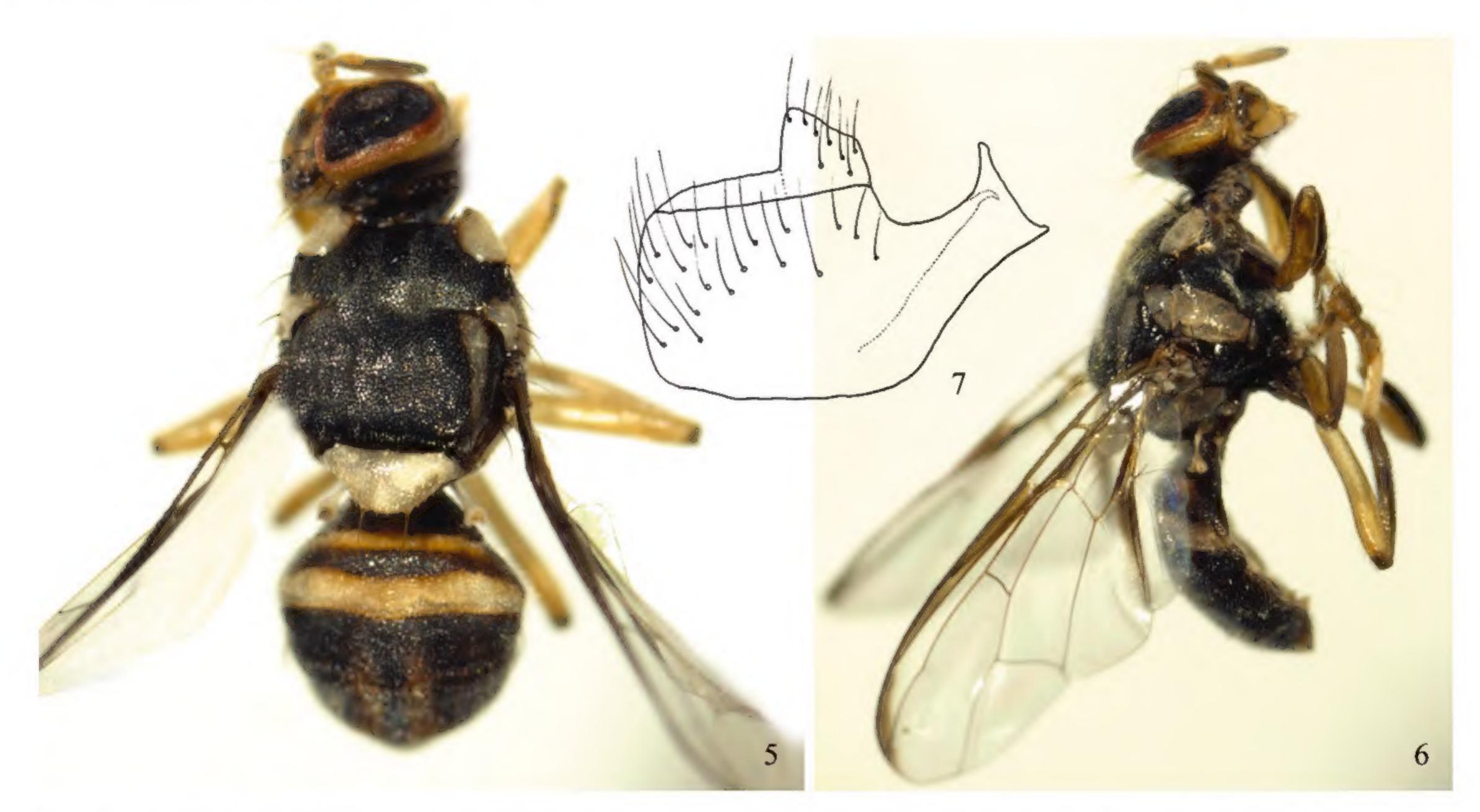
Head. Vertical length 1.2 – 1.4 mm. Fulvous with fuscous around orbital setae and on anteromedial hump; orbital setae black: 1 s. or., 2 i. or.; lunule black. Ocellar triangle black. Vertex fulvous. Face black entirely (Fig. 1). Gena fulvous, black subocular spot present, black seta present. Occiput black, yellow along eye margins. Occipital row with 3 dark setae. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface. Arista black (fulvous basally). Length of segments: 0.20 mm; 0.33 mm; 0.72 mm.

Thorax. Scutum (Fig. 2) black except brown below later postsutural vittae, around transverse suture. Pleural areas black except brown below postpronotal lobes. Yellow markings as follows: postpronotal lobe; notopleuron; broad sized mesopleural stripe, reaching anterior npl. seta dorsally; anatergite (posterior apex black); anterior

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Figs 1 – 4. Bactrocera (Bactrocera) nigrifacia sp. nov., 3. 1. Dorsal view. 2. Lateral view. 3. Head in front view. 4. Epandrium, cercus and surstylus in profile.



Figs 5 – 7. Bactrocera (Bactrocera) hardyi sp. nov.,  $\delta$ . 5. Dorsal view. 6. Lateral view. 7. Epandrium, cercus and surstylus in profile.

2/3 of katatergite (remainder black); two medium parallel sided later postsutural vittae ending before ia. setae. Postnotum black. Scutellum yellow except for narrow black basal band. Setae: sc. 2; presc. 2; ia. 1; p. sa. 1; a. sa. 1; mpl. 1; npl. 2; scp. 4; all setae well developed and black.

Wings (Fig. 3). Length 4.2 – 5.6 mm; cells be and c colourless; cell br with microtrichia anteriorly, but clear posteriorly; a very narrow fuscous costal band confluent with R2+3 and ending between extremities of R4+5 and M; a narrow dark anal streak ending well before wing margin; dense microtrichia around A1 and CuA<sub>2</sub>; supernumerary lobe of medium

development.

Legs. Fore femora black on dorsal surface, fulvous apically and basally, with rows of long black setae on dorsal suface; mid femora black predominantly; apical 2/5 of hind femora black; fore tibiae fulvous, mid tibiae brown basally, hind tibiae black.

Abdomen (Fig. 2). Oval; terga free; pecten present on tergum 3. Tergum 1 black except for a narrow, short orange-brown band on median portion, but not reaching lateral margins; tergum 2 orange-brown with a broad dark transverse band across anterior portion reaching lateral margins; terga 3 – 5

predominantly black with a narrow medial longitudinal dark band over terga 3 to 5. Posterior lobe of surstylus short (Fig. 4).

Female. Unknown.

Etymology. This specific name is derived from nigr- (= black) and faci- (= face), reflecting the marks of male face.

Holotype &, China, Jinghong (22.01° N, 100.48°E), Yunnan Province, 2 Sep. 2010, attracted to cue-lure, ZHANG Nan-Nan. Paratypes 3 & &, same data as holotype.

Distribution. China, Yunnan (Jinghong).

Host plant. Unknown.

Attractant. Cue-lure.

Remarks. This is a new member of *B. dorsalis* complex, it is similar to *B.* (*Bactrocera*) nigrofemoralis White et Tsuruta in possessing entirely black face in male. It differs from nigrofemoralis in possessing two medium parallel sided later postsutural vittae ending before ia. setae, tergum 2 orange-brown with a broad dark transverse band across anterior portion reaching lateral margins.

Bactrocera (Bactrocera) hardyi sp. nov. (Figs 5 – 7)
Description. Male, body length 5.4 mm.

Head. Vertical length 1.2 mm. Fulvous with fuscous around orbital setae and on anteromedial hump; orbital setae dark: 1 s. or., 2 i. or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small oval spots. Gena fulvous, brown subocular spot present, fuscous black seta present. Occiput black, yellow along eye margins. Occipital row with 4 dark setae. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface. Arista black (fulvous basally). Length of segments: 0.19 mm; 0.29 mm; 0.63 mm.

Thorax. Scutum (Fig. 5) black except brown around transverse suture, between lateral postsutural vitta and base of wing. Pleural areas black except redbrown below postpronotal lobes. Yellow markings as follows: postpronotal lobe; notopleuron; medium sized mesopleural stripe, reaching midway between anterior margin of notopleura and anterior npl. seta dorsally; anatergite (posterior apex black); anterior 3/5 of katatergite black (remainder black); two broad triangular later postsutural vittae narrowing sharply posteriorly ending before ia. setae. Postnotum black. Scutellum yellow except for narrow black basal band. Setae: sc. 2; presc. 2; ia. 1; p. sa. 1; a. sa. 1; mpl. 1; npl. 2; scp. 4; all setae well developed and black.

Wings. Length 3.8 mm; cells bc and c colourless; cell br with microtrichia anteriorly, but clear posteriorly. Remainder of wings colourless except dark fuscous cell sc, narrow fuscous costal band

confluent with R2 +3 and widening slightly as it crosses this vein to end between extremities of R4 +5 and M; a narrow black anal streak ending well before wing margin; dense microtrichia around A1 and CuA<sub>2</sub>; supernumerary lobe of medium development.

Legs (Fig. 6). Fore femora fulvous with fuscous spots on outer apical surface, mid and hind femora fulvous with very narrow fuscous band apically. Fore tibiae fuscous; mid tibiae fulvous but fuscous on 1/3 of outer basal surface, each with an apical black spur; hind tibiae fuscous black entirely.

Abdomen (Fig. 5). Oval; terga free; pecten present on tergum 3. Tergum 1 black except for a narrow, short orange-brown band on median portion, but not reaching lateral margins; tergum 2 orange-brown with a broad dark transverse band across anterior portion reaching lateral margins; terga 3 – 5 predominantly black. Posterior lobe of surstylus short (Fig. 7).

Female. Unknown.

Etymology. This species is named for the taxonomist Dilbert E. Hardy

Holotype &, China, Yunnan Province, Jinghong (22.01°N, 100.48°E), 4 Sep. 2010, attracted to cue-lure, ZHANG Nan-Nan leg. Paratypes 3 & &, same data as holotype.

Distribution. China, Yunnan (Jinghong).

Host plant. Unknown.

Attractant. Cue-lure.

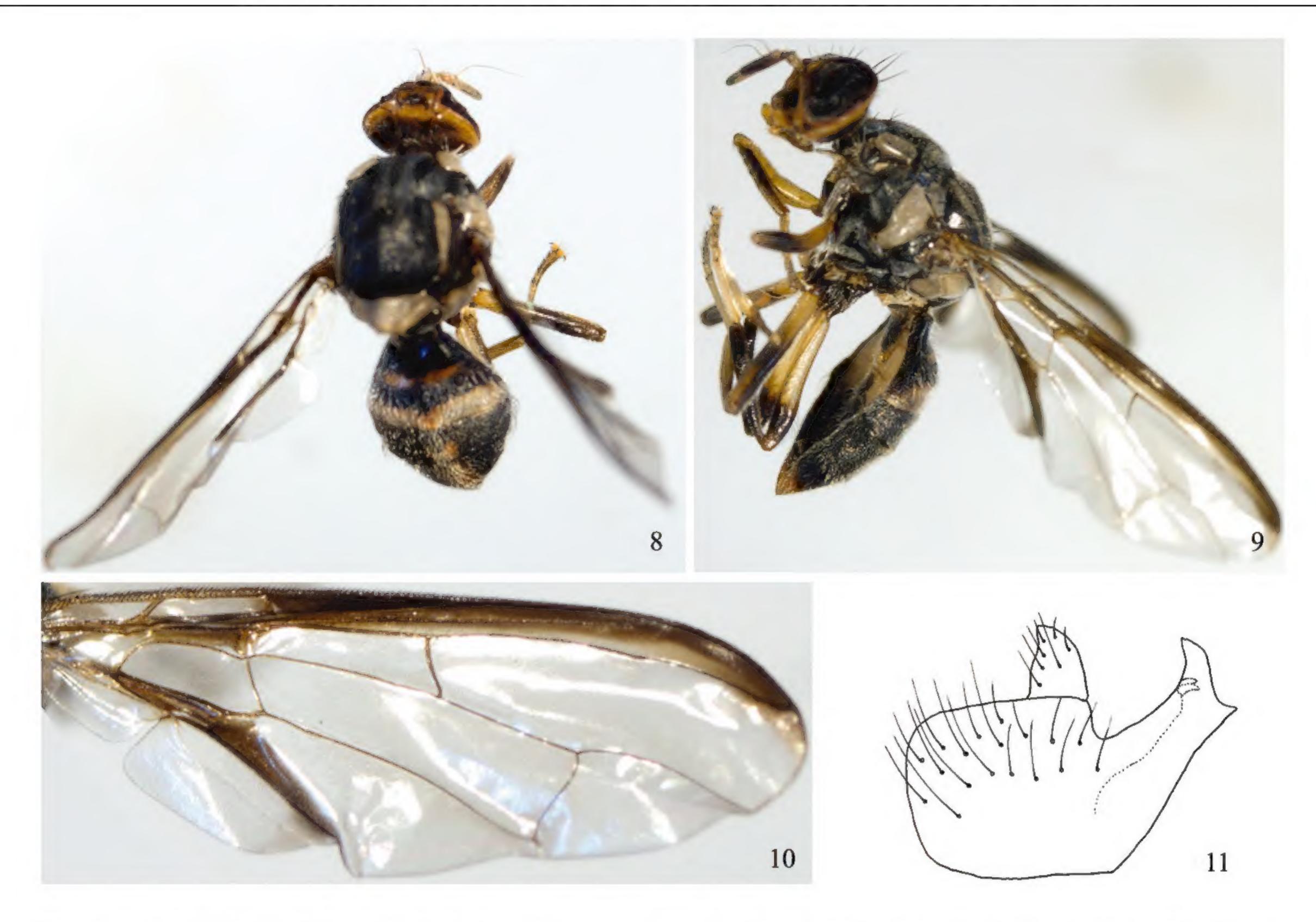
Remarks. It is similar to Bactrocera (Bactrocera) indonesiae Drew et Hancock in possessing triangular postsutural vittae narrowing sharply posteriorly ending before ia. setae, fore and hind tibiae fuscous to dark fuscous. It differs from indonesiae in possessing terga 3 – 5 predominantly black, fore femora fulvous with fuscous spots on outer apical surface, mid and hind femora fulvous with very narrow fuscous band apically.

# Bactrocera (Bactrocera) jinghongensis sp. nov. (Figs 8-11)

Description. Male, body length 7.5 mm.

Head. Vertical length 1.5 mm. Fulvous with fuscous around orbital setae and on anteromedial hump; orbital setae black: 1 s. or., 2 i. or.; lunule black. Ocellar triangle black. Vertex fuscous. Face fulvous with big sized circular spots. Gena fulvous, brown subocular spot present, brown seta present. Occiput black, yellow along eye margins. Occipital row with 5 dark setae. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface. Arista black (fulvous basally). Length of segments: 0.20 mm; 0.34 mm; 0.72 mm.

Thorax (Fig. 8). Scutum black except brown



Figs 8 – 11. Bactrocera (Bactrocera) jinghongensis sp. nov., 3. 8. Dorsal view. 9. Lateral view. 10. Wing. 11. Epandrium, cercus and surstylus in profile.

around transverse suture. Pleural areas black except red-brown below postpronotal lobes. Yellow markings as follows: postpronotal lobe; notopleuron; broad sized mesopleural stripe, almost reaching anterior npl. seta dorsally; anatergite (posterior apex black); anterior 2/3 of katatergite (remainder black); two medium tapering posteriorly later postsutural vittae ending at ia. setae. Postnotum black. Scutellum yellow except for narrow black basal band. Setae: sc. 2; presc. 2; ia. 1; p. sa. 1; a. sa. 1; mpl. 1; npl. 2; scp. 4; all setae well developed and black.

Legs (Fig. 9). 2/3 of fore femora black on outer apical surface; apical 1/2 of mid femora black, with rows of long black setae on dorsal surface; apical 1/3 of hind femora black. Fore tibiae fuscous; mid tibiae fuscous basally; hind tibiae black entirely.

Wings (Fig. 10). Length 6.4 mm; cells be colourless; cell c with microtrichia posteriorly, but clear anteriorly; cell br with dense microtrichia anteriorly, but clear posteriorly; fuscous dark costal band almost confluent with R4 + 5 and swelling at apex; a narrow dark anal streak ending well before wing margin; dense microtrichia around A1 and CuA2; supernumerary lobe of medium development.

Abdomen (Fig. 8). Oval; terga free; pecten present on tergum 3. Tergum 1 black except for a narrow, short orange-brown band on median portion, but not reaching lateral margins; tergum 2 orange-brown with a broad dark transverse band across

anterior portion reaching lateral margins; terga 3 – 5 predominantly black with a narrow medial dark band over terga 3 – 5. Posterior lobe of surstylus short (Fig. 11).

Female. Unknown.

Etymology. This species is named for the type Locality Jinghong.

Holotype &, China, Yunnan Province, Jinghong (22.01°N, 100.48°E), 4 Sep. 2010, attracted to cue-lure, ZHANG Nan-Nan leg. Paratypes 4 & &, same data as holotype.

Distribution. China, Yunnan (Jinghong).

Host plant. Unknown.

Attractant. Cue-lure.

Remarks. It is similar to Bactrocera (Bactrocera) kinabalu Drew et Hancock in possessing the general characters of B. dorsalis complex, and fuscous costal band overlapping R2 + 3 and swelling around apex of R4 + 5, fore and hind tibiae fuscous to black. It differ from kinabalu in lateral postsutural ending at ia. setae, apical 1/2 of mid femora black.

### Bactrocera (Zeugodacus) vultus (Hardy, 1973) New record to China (Figs 12 – 16)

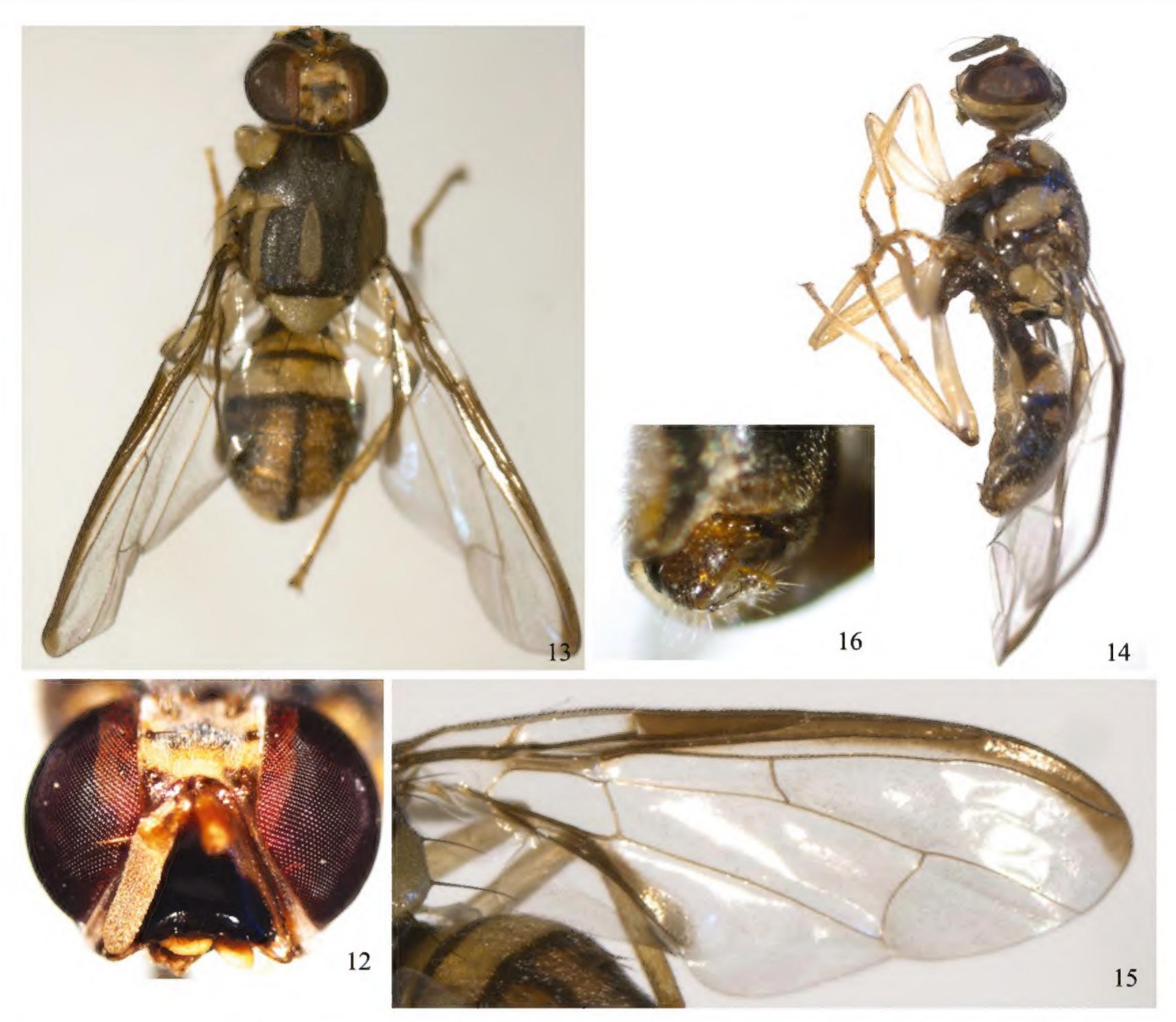
Dacus (Zeugodacus) vultus Hardy, 1973. Pacif. Insects Monogr., 31: 74.

Type locality: Thailand (Yala).

Bactrocera (Zeugodacus) vultus: White et Hancock, 1997. Windows CD-ROM.

Bactrocera vultus: Evenhuis, 2004. Bis. Mus. Bull. Ent., 12: 217.

Diagnosis. Male. Face predominantly black except for a narrow margin along eyes. Scutum black



Figs 12 – 16. Bactrocera (Zeugodacus) vultus (Hardy, 1973), & . 12. Head in front view. 13. Dorsal view. 14. Lateral view. 15. Wing. 16. Epandrium, cercus and surstylus in lateral view.

with 3 postsutural vittae, median postsutural yellow vitta equal or slightly wider than the lateral vittae, ending behind prescutellar bristles, two parallel sided lateral yellow vittae ending behind ia. setae. Scutellum yellow except for a narrow black basal band. Legs entirely yellow except for brown hind coxae, and hind tibiae basally; also with a narrow posterior streak of brown along basal 1/2 of front tibiae. Wing hyaline except black costal band overlapping vein R2 + 3 and expanding slightly across apex of R4 + 5, broad fuscous anal streak ending at wing margin. Abdomen largely yellow, with black bands across bases of terga 2 - 3 and with lateral margins of terga black. Also posterolateral portions of terga 4 and 5 black, a broad medial longitudinal black band extending over terga 3 -5. Length of body 5.8 - 6.6 mm, of wing 5.4 -5. 8 mm.

Material examined. 8 & & . China, Yunnan Province, Jinghong, 20 Dec. 2010.

Distribution. China (Yunnan, Jinghong); Thailand (Yala), Burma.

Attraction. Males attracted to cue-lure.

Remarks. This species is similar to *Bactrocera* (*Zeugodacus*) atrifacies (Perkins) in having the face predominantly black and 3 postsutural yellow vittae on

the thorax. It differs from the latter in having broader costal band, the legs entirely yellow except for the brown hind coxae, and the hind tibiae basally; also with a narrow posterior streak of brown along basal 1/2 of front tibiae.

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### 云南景洪果实蝇属三新种及一新纪录种记述 (双翅目,实蝇科)

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摘要 记述采自中国云南景洪的果实蝇属 3 新种和中国 1 新纪录种: 滇黑寡鬃实蝇 Bactrocera (Bactrocera) nigrifacia sp. nov., 哈迪氏果实蝇 B. (B.) hardyi sp. nov., 景洪果实蝇 B. (B.) jinghongensis sp. nov. 和黑颜面实蝇 Bactrocera (Zeugodacus) vultus (Hardy, 1973), 3 新种均符合 Drew et Hancock (1994) 对桔小实蝇复合体的定义。模式标本保存于福建农林大学益虫研究所。

### 滇黑寡鬃实蝇,新种 Bactrocera (Bactrocera) nigrifacia sp. nov. (图 1~4)

新种与黑胫实蝇 B. (Bactrocera) nigrofemoralis White et Tsuruta 相近,颜均为黑色,与后者的区别在于: 2条平行的缝后侧黄色条终止于翅内鬃之前,第2腹背板橙棕色且前缘具黑色横带。

正模  $\delta$  ,云南景洪,2010-09-02,Cue-lure 引诱,张南南采。副模 3  $\delta$   $\delta$  ,同正模。

词源:新种种名根据颜面黑色而命名。

哈迪氏果实蝇, 新种 Bactrocera (Bactrocera) hardyi sp. nov.

关键词 双翅目,实蝇科,果实蝇属,新种,景洪,中国. 中图分类号 Q969.456.8 (图5~7)

新种与印尼实蝇 Bactrocera (Bactrocera) indonesiae Drew et Hancock 相近,与后者的区别为:第3~5 腹背板黑褐色,前足腿节黄褐色,且端部具黑褐色斑,中足和后足腿节为黄褐色,且端部具很短的黑褐色条纹。

正模  $\delta$  , 云南景洪, 2010-09-04, Cue-lure 引诱, 张南南采。副模 3  $\delta$   $\delta$  , 同正模。

词源:新种种名以双翅目分类专家 Dilbert E. Hardy 的姓氏命名。

## 景洪果实蝇,新种 Bactrocera (Bactrocera) jinghongensis sp. nov. (图 8~11)

新种与基纳巴卢实蝇 Bactrocera (Bactrocera) kinabalu Drew et Hancock 相近,与后者的区别在于:缝后侧黄色条终止于 翅内鬃之前,中足腿节端部 1/2 黑色。

正模  $\delta$  , 云南景洪, 2010-09-04, Cue-lure 引诱, 张南南采。副模  $4\delta\delta$  , 同正模。

词源:新种种名以模式产地命名。

<sup>\*</sup> 通讯作者.